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**Beall et al.**

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(54) **CORDIERITE POROUS CERAMIC HONEYCOMB ARTICLES WITH DELAYED MICROCRACK EVOLUTION**

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CPC ..... **C04B 38/0006** (2013.01); **B01D 46/2429**  
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See application file for complete search history.

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(57) **ABSTRACT**

A porous ceramic honeycomb article includes a primary cordierite phase and an intercrystalline glass phase. In an as-fired condition, the porous ceramic honeycomb article exhibits microcrack parameter  $Nb^3 \leq 0.06$  and an as-fired  $E_{500^\circ C.}/E_{25^\circ C.}$  ratio  $\leq 0.99$ . The article exhibits a coated microcrack parameter  $Nb^3 \leq 0.14$  and a coated  $E_{500^\circ C.}/E_{25^\circ C.}$  ratio  $\leq 1.06$  after the porous ceramic honeycomb article has been washcoated and calcined at a temperature of  $550^\circ C.$  After the article is exposed to a thermal treatment at a temperature  $\geq 800^\circ C.$  following washcoating and calcining, at least a first portion of the porous ceramic honeycomb article has a first treated microcrack parameter  $Nb^3 \geq 0.18$ , and a first treated mean coefficient of thermal expansion of not more than  $12 \times 10^{-7}/^\circ C.$  over a temperature range of  $25^\circ C.$  to  $800^\circ C.$  Methods of forming the porous ceramic honeycomb article are also disclosed.

**15 Claims, 8 Drawing Sheets**

